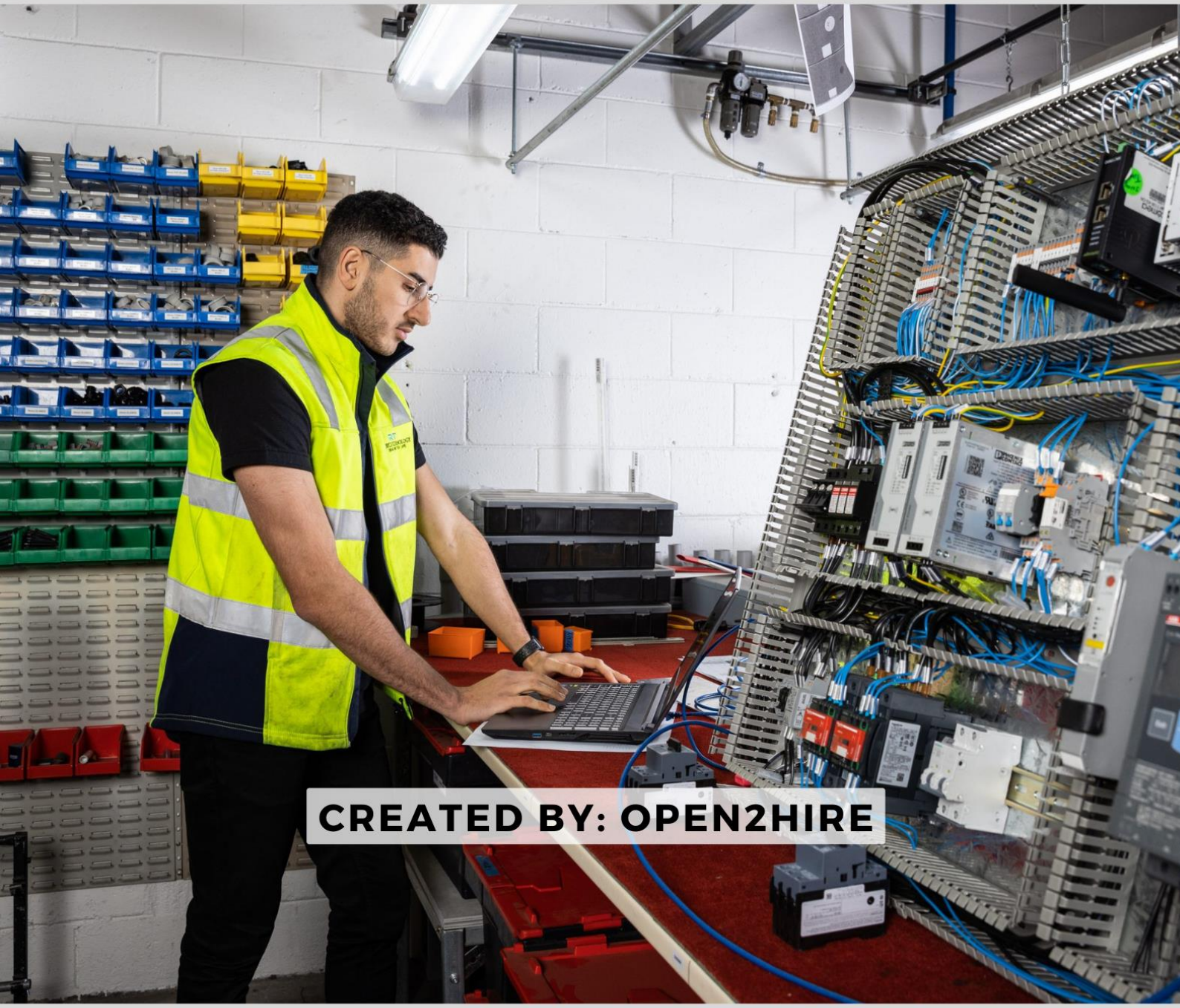
PLC Interviews Questions With Answers



CREATED BY: OPEN2HIRE

WWW.OPEN2HIRE.COM

Open2hire
Number one online job listing

PLC Interviews Questions with Answers

Introduction

Programmable Logic Controllers (PLCs) are widely used in industrial automation and control systems. PLCs are specialized computers that are designed to control machines and processes. PLCs use a variety of input and output devices, such as sensors, switches, and actuators, to monitor and control the operation of industrial machinery and equipment.

If you are preparing for a job interview in the field of electrical or automation engineering, it's likely that you will be asked about PLCs. Interview questions about PLCs can cover a wide range of topics, from the basic principles of PLC operation to more advanced topics such as programming and troubleshooting.

In general, the interviewer will be looking for candidates who have a strong understanding of PLCs and are able to apply this knowledge to real-world problems. Some common topics that are covered in PLC interviews include:

- Basic principles of PLC operation
- Types of PLC programming languages
- Programming techniques and best practices
- Troubleshooting and fault-finding techniques
- Safety considerations for PLCs
- Integration of PLCs with other systems and devices

By preparing for these topics and practicing your responses to common interview questions, you can increase your chances of success in a PLC interview. It's also a good idea to research the company and the specific job requirements before the interview, so that you can tailor your responses to the needs of the organization.

Frequently Asked PLC Interview Questions with Answers

Q: What is a PLC?

A: A PLC is a programmable electronic device that is used to control industrial processes and machines.

Q: What are the advantages of using a PLC over traditional relay logic?

A: Some advantages of using a PLC over traditional relay logic include: greater flexibility and expandability, easier troubleshooting and maintenance, reduced wiring and panel space requirements, and improved process control.

Q: What are the basic components of a PLC system?

A: The basic components of a PLC system include: a central processing unit (CPU), input and output modules, a power supply, and programming and configuration software.

Q: What is ladder logic?

A: Ladder logic is a graphical programming language that is used to program PLCs. It is based on relay logic and uses graphical symbols to represent logic functions.

Q: What is the scan cycle in a PLC?

A: The scan cycle in a PLC is the process by which the CPU scans the inputs, executes the program logic, and updates the outputs. The cycle typically occurs at a high frequency, such as every few milliseconds.

Q: What is the purpose of a watchdog timer in a PLC?

A: A watchdog timer in a PLC is a timer that is used to monitor the operation of the CPU. If the timer expires before the CPU completes a cycle, it is assumed that the CPU has malfunctioned and the PLC enters a fault mode.

Q: What is a PID controller?

A: A PID controller is a type of controller that is used to regulate a process variable (such as temperature, pressure, or flow) by adjusting the output of a control element (such as a valve or heater) based on feedback from sensors.

Q: What is the difference between a PLC and a DCS (Distributed Control System)?

A: A PLC is typically used to control discrete processes (such as individual machines or pieces of equipment), while a DCS is typically used to control continuous processes (such as chemical plants or power plants).

Q: What is remote I/O?

A: Remote I/O is a system in which the input and output modules of a PLC are located remotely from the central processing unit, often connected by a network or bus.

Q: What is scan time in a PLC?

A: Scan time in a PLC is the time it takes for the CPU to scan all the inputs, execute the program logic, and update all the outputs.

Q: What is the difference between a relay and a PLC?

A: A relay is a mechanical switch that is used to control electrical circuits, while a PLC is an electronic device that is programmed to control industrial processes.

Q: What is a function block diagram?

A: A function block diagram is a graphical programming language that is used to program PLCs. It uses functional blocks to represent logic functions and their interconnections.

Q: What is the difference between a digital input and a digital output in a PLC?

A: A digital input in a PLC is used to detect the status of a digital signal (such as a switch or sensor), while a digital output is used to control the status of a digital signal (such as a motor or valve).

Q: What is a program scan?

A: A program scan is the process by which the PLC executes the program logic to control the process. The scan is usually performed repeatedly at a high frequency.

Q: What is the difference between a ladder diagram and a function block diagram?

A: A ladder diagram uses graphical symbols to represent the logic functions and their interconnections, while a function block diagram uses functional blocks to represent the logic functions and their interconnections.

Q: What is a timer in a PLC?

A: A timer in a PLC is a function block that is used to generate a delay or time interval based on the input signal. The output of the timer changes state when the time interval has elapsed.

Q: What is a counter in a PLC?

A: A counter in a PLC is a function block that is used to count the number of input pulses that occur within a specified time interval. The output of the counter changes state when the count value reaches a predetermined value.

Open2hire
one online job listing

Q: What is a PID loop in a PLC?

A: A PID loop in a PLC is a function block that is used to regulate a process variable (such as temperature or pressure) using a Proportional-Integral-Derivative algorithm. The output of the PID loop is used to adjust the control element (such as a valve or heater) to maintain the desired setpoint.

Q: What is a data register in a PLC?

A: A data register in a PLC is a memory location that is used to store data values (such as setpoints, process variables, or control outputs) that are used by the program logic.

Q: What is the role of an input module in a PLC?

A: An input module in a PLC is used to interface with the sensors and switches that detect the state of the industrial process. The input module

converts the electrical signal from the sensor into a digital signal that the PLC can process.

Q: What is the role of an output module in a PLC?

A: An output module in a PLC is used to interface with the actuators and other devices that control the industrial process. The output module converts the digital signal from the PLC into an electrical signal that can control the device.

Q: What is the difference between a discrete input and an analog input in a PLC?

A: A discrete input in a PLC detects the state of a digital signal (such as a switch or sensor), while an analog input in a PLC detects the value of an analog signal (such as a voltage or current). An analog input can detect a range of values within a specified range, while a discrete input can only detect two states (on/off).

Q: What is a sequencer in a PLC?

A: A sequencer in a PLC is a function block that is used to control a sequence of events in the industrial process. The sequencer controls the order and timing of the events based on the input signals and the program logic.

Q: What is the role of the programming software in a PLC system?

A: The programming software in a PLC system is used to create, modify, and download the program logic to the PLC. The software provides a user interface for creating the program logic using graphical programming languages and configuring the input and output modules.

Q: What is the difference between a local I/O and a remote I/O system?

A: A local I/O system in a PLC has the input and output modules located in the same physical location as the PLC, while a remote I/O system has the input and output modules located remotely from the PLC. Remote I/O systems use communication networks to connect the input and output modules to the PLC.

Q: What is the difference between a closed-loop and an open-loop control system?

A: A closed-loop control system uses feedback from sensors to adjust the control output and maintain the desired setpoint, while an open-loop control system does not use feedback and relies on a predetermined control output.

Q: What is a safety relay in a PLC system?

A: A safety relay in a PLC system is a special type of relay that is used to ensure the safety of the industrial process. The safety relay monitors the status of safety devices (such as emergency stop buttons or safety mats) and shuts down the process if a safety condition is detected.

Q: What is a scan time in a PLC system?

A: A scan time in a PLC system is the time it takes for the PLC to execute one complete cycle of the program logic. The scan time depends on the complexity of the program logic and the processing power of the PLC.

Q: What is a watchdog timer in a PLC system?

A: A watchdog timer in a PLC system is a hardware or software timer that is used to monitor the operation of the PLC. If the watchdog timer does not receive a signal from the PLC within a specified time interval, it will trigger a fault condition and shut down the process.

Q: What is a hot standby system in a PLC system?

A: A hot standby system in a PLC system is a redundant configuration in which two identical PLCs are connected in parallel to the input and output modules. One PLC is designated as the primary unit and the other as the backup unit. If the primary unit fails, the backup unit takes over the control of the process.

Q: What is a ladder logic diagram in a PLC system?

A: A ladder logic diagram in a PLC system is a graphical programming language that is used to program the PLC. It uses ladder-like rungs to represent the logic functions and their interconnections. Ladder logic

diagrams are easy to read and are commonly used in industrial automation applications.

Q: What is a loopback test in a PLC system?

A: A loopback test in a PLC system is a diagnostic test that is used to verify the communication between the PLC and the input and output modules. In a loopback test, the output signal from the PLC is connected directly to the input signal of the same module. If the input signal is detected correctly, it indicates that the communication between the module and the PLC is working properly.

Q: What is a PLC scan cycle in a PLC system?

A: A PLC scan cycle in a PLC system is the process by which the PLC reads the input signals, executes the program logic, and writes the output signals to control the industrial process. The scan cycle is performed repeatedly at a high frequency to ensure that the process is controlled in real-time.

Q: What is a PLC rack in a PLC system?

A: A PLC rack in a PLC system is a mechanical structure that houses the input and output modules and the PLC processor. The rack provides a modular and expandable design for the PLC system.

Q: What is the difference between a timer and a counter in a PLC system?

A: A timer in a PLC system is a function block that counts time intervals, whereas a counter is a function block that counts events or pulses. Timers are typically used to trigger an action after a specified time delay, while counters are used to count the number of times a particular event occurs.

Q: What is the purpose of a PID controller in a PLC system?

A: A PID controller in a PLC system is a function block that is used to regulate a process variable, such as temperature or pressure, by adjusting the control output. The PID controller calculates an error signal that represents the difference between the desired setpoint and the measured process variable, and then adjusts the control output based on the proportional, integral, and derivative terms of the controller.

Q: What is the difference between a sinking and sourcing input/output module in a PLC system?

A: A sinking input/output module in a PLC system is one in which the load is connected to the negative side of the power supply, while a sourcing module is one in which the load is connected to the positive side of the power supply. The choice between sinking and sourcing modules depends on the type of load being controlled and the electrical requirements of the application.

Q: What is a safety PLC in a PLC system?

A: A safety PLC in a PLC system is a specialized type of PLC that is designed to meet safety-related standards, such as EN 61508 and EN 13849. Safety PLCs are used in applications where safety is critical, such as in industrial machinery and transportation systems. They have built-in safety functions and redundant hardware and software to ensure that the system operates safely.

Q: What is a function block in a PLC system?

A: A function block in a PLC system is a pre-built software module that performs a specific control function, such as a timer, counter, or PID controller. Function blocks can be combined and interconnected to create more complex control functions, and they provide a modular and reusable design for the PLC program.

Open2hire
Number one online job listing

Q: What is the role of the input/output (I/O) modules in a PLC system?

A: The input/output (I/O) modules in a PLC system are responsible for interfacing with the external devices and sensors that are used to control the industrial process. The input modules read the signals from the sensors and convert them into digital signals that can be processed by the PLC, while the output modules generate the control signals that are sent to the actuators and devices to control the process.